

occupying a point on the north-west side of the mountain, and red-hot lava began to flow down the Atrio del Cavallo.

"On May 2 we all left our hotel at a quarter-past 5 P.M. for Vesuvius, driving up to the Hermitage, and then walking about a mile to the incandescent stream.

"The distant view presented a zig-zag line of fire. As we approached we saw the movement of this stream of lava; in some points solid masses were turned over and moved downwards; in others, bright points occurred where some tree or other combustible was inflamed. Nothing could be more splendid. It was a river of fire from fifty to one hundred yards in breadth.

"We had seen the Falls of Niagara and the glaciers of the Alps, all of a stupendous beauty; but this was sublime and fearful.

"The lava on which we stood, near this stream was warm and on raising a portion the substratum was red-hot. Was it quite safe to be there?

"The view was magnificent, and our position possessed quite sufficient of the fearful to make it sublime: a scene of moving molten masses of liquid fire.

"The stream issued, not from the summit of the mountain, as heretofore, but from its north-western side, on which seven apertures existed. From the highest of these a burst of fire took place upwards from time to time.

"The stream seems to issue in a viscid half-liquid state, whilst its surface, and especially its edges, cold by contact with the atmosphere, become solid, forming a channel and floating or rolling masses. The lava remains long incandescent, even when it has become solid, being a bad conductor of heat. On the same principle the masses of consolidated lava are formed in minor masses, giving to the general mass of surface the most irregular forms, frequently with sharp and prominent edges and projections. Even when these masses are the smallest, it is difficult and even dangerous to walk upon them.

"On Saturday, May 5, I ascended to the summit with Dr. Bishop and my son. From the great crater at the summit there issued much smoke, consisting chiefly of sulphurous acid gas. This proved extremely irritating to the nostrils and bronchia, inducing sneezing and coughing. Three openings existed near together along the edge of the crater at the very summit, which emitted a similar vapour. At points considerably lower, three larger openings were formed on the north side of the cone, from which immense quantities of smoke issued, mingled with fire, differing somewhat in colour, and depositing sulphur of a light green, orange, and bright yellow colour. At a distance the green sulphur, spread over ancient lava, was mistaken, even by our guide, for vegetation, but proved to be sulphur on a nearer examination.

"Below the third of these larger openings there was a cascade of red-hot lava from the edge of a precipice, of immense dimensions, presenting a sublime fall of liquid fire.

"Along this part of the cone masses of stone continually rolled down the slope, dislodged by the movement of the cone (for none were ejected), which some of our party felt distinctly.

"Below the fall the lava proceeded in a continuous stream, consisting partly of flowing, partly of rolling masses, pursuing an irregular course downwards in the Atrio del Cavallo, in one place dividing into two, in others taking a zig-zag turn. From its surface a dense smoke arose generally, but in some places the existence and combustion of a tree gave a bright blaze of light.

"The surface of some parts of the lava stream had already cooled and consolidated sufficiently to admit of our walking over it. This surface was crisp and wave-like, and in some parts sounded hollow when struck with our staffs.

"We picked up one specimen of porous lava, in a crevice of which a fly of considerable size was imprisoned, a miniature picture of *Herculaneum* or *Pompeii*. Our boots were torn to tatters."

CHARLOTTE HALL

Brighton, May 10

Earthquakes and Permanent Magnets

IN a notice by Dr. A. B. Meyer in No. 116, vol. v. of *NATURE*, respecting earthquakes in the Island of Celebes, he states that the often-repeated story of the keepers of permanent magnets detaching themselves, and falling at the moment of an earthquake shock, was never verified in his experience. If I remember rightly, this peculiar action was first mentioned by a Frenchman living on the west coast of South America, and much doubted by many at the time. It is not

likely that there is any difference between the effect of an American and an Asiatic earthquake on the magnet, if any such exists; but I must state, in corroboration of Dr. Meyer's note, that I have had a permanent magnet and keeper suspended in my study for many years, expressly for the purpose of testing this matter, and on no occasion of an earthquake has the keeper fallen from the magnet, not even in the terrific earthquake of 1863, which was so destructive to the city of Manila and the neighbouring provinces.

The terrestrial disturbances still continue in the Philippines, and almost every post brings us intelligence of earthquakes in the provinces. More has occurred lately: an eruption of the Mayou, a magnificent volcano in the province of Albay, unaccompanied, however, by any serious disasters. As I have already mentioned in my notice of the new volcano which suddenly broke out in the island of Camiguin,* the past year has been remarkable for the great number of earthquakes throughout the Archipelago, especially in the great island of Mindanao, where the new military colony on the great river suffered greatly.

Manila

W. W. WOOD

The Australian Eclipse Expedition

IN your number of *NATURE* for December 7, 1871, it is stated, in regard to the Eclipse Expedition, that "notwithstanding the supineness displayed by the other Australian colonies, it was still hoped that the Government of Victoria would render such pecuniary assistance as would make it possible for the Expedition to set out with some chance of success in obtaining results of scientific value."

Now, while giving all honour to the Royal Society of Victoria for originating and carrying out the expedition, it is only bare justice to the colonies of New South Wales and Queensland to state that, but for the liberal way in which they responded to the cause of science, there would have been no Eclipse Expedition here. No steamer could be obtained in Victoria within the means of the Royal Society, and, at the instance of the Government of New South Wales, who were moved by their astronomer, the Government of Queensland lent a steamer and contributed 115*l.* in money; while the Government of New South Wales contributed 330*l.* to the funds of the Royal Society of Victoria for the Eclipse Expedition, and upwards of 130*l.* towards the expense of steamer and their own observing party, besides sending Lieut. Gowlland, without whose aid in navigating the ship in those dangerous waters, the ship would not have been lent, and there would have been no Expedition here.

A SYDNEY MEMBER OF THE ECLIPSE EXPEDITION

Sydney, March 25

* * * Our information was derived from correspondents in Australia. We gladly notify the correction, and give the Governments of Queensland and New South Wales their due.—ED. *NATURE*.

Waterspouts in the Fen-land

THE letter of Mr. Gray on a waterspout observed by him on the river Ebwy, which appeared in your number for April 25, vividly recalled a similar case which has come under my notice in the Fen-land.

During the summer of 1870, while in Deeping Fen on a day when the wind was blowing in gusts, carrying the dry powdery peat-dust in clouds before it, I observed a whirling column of dust advancing towards me. It was like those smaller pillars so frequently seen in the streets of a town on such a day, but was considerably larger, being from 15 to 20 feet in height. When it was first seen it was advancing from the far side of a *ground*, as the unenclosed fields are called, towards me at the rate of about six miles an hour, and was distant some five hundred yards. It moved with an unsteady staggering motion, accompanied with a rushing noise. I stayed to watch it cross a dyke about 15 feet wide, which ran directly across its path. The smaller dykes it seemed to cross without affecting them, but on reaching the one in question it whisked the water up into a waterspout some 10 feet high with a gurgling hissing sound, and steering directly across the dyke burst on reaching the opposite shore, projecting a considerable quantity of water upon the land. This effort seemed to spend its force, for the dust-column resumed on the opposite

* In some accounts of this phenomenon, the island of Camiguin on the coast of Mindanao, has been confounded with another island of the same name in the Bataanes, to the north of Luzon.

land was but small in proportion, and after swaying about for a few yards, died away.

I have been informed of similar cases in this district, but the above is the only instance in which I observed a waterspout myself.

SYDNEY B. J. SKERTCHLY

H.M. Geological Survey, Wisbech, May 2.

The Geologists' Association at Watford

In the notice in your last number of the excursion of the Geologists' Association to Watford there is a slight error which perhaps I may be permitted to correct.

The sections of the Woolwich and Reading Series which were examined are at Watford Heath Kiln and at Bushey Kiln (not Bushey Heath), and the formation, although varying very much in the short distance (scarcely a mile) that these places are apart, is at each place represented by beds of clay, sand, and pebbles. The pebble beds are, however, better seen at the latter than at the former place.

JOHN HOPKINSON

Temperature of Hill and Valley

IN NATURE of May 2, page 19, there is an interesting report of a paper by Mr. Dines "On the Temperature of Hill and Valley," showing that (to use Mr. Gaster's words in the discussion) "the air is colder on the top of the hill than in the valley, by day, when the sun is shining, and warmer at night when it is not shining." This appears anomalous at first sight, but I believe it has long been known, and it is easily explained. The temperature of the hill top is not produced where it is observed. As Mr. Glaisber stated in the same discussion, the higher we go in a balloon the less is the range of temperature; and the temperature at the top of a hill which is at all isolated, or even steep on one side, approximates to that observed in a balloon at the same absolute height.

The reason why temperature has a less range in the higher atmospheric strata, is that the earth has very much more power of both absorbing and radiating heat than the molecules of air, and consequently heats more rapidly in the daytime and cools more rapidly at night. The temperature of air at the surface of the earth is determined much more by the absorption and radiation of the earth than by its own.

The truth of this view is shown by the fact that the law is quite different for table-lands from that which we have seen to be true for isolated hills. On table-lands the diurnal range of temperature is greater than on low plains, though on isolated hills it is less. These facts appear to show that while, other conditions being given, the mean temperature of a station chiefly depends on its height above the sea level (or, in other words, the thickness of the atmosphere above it) the diurnal range at the station (whether hill top or balloon) chiefly depends on the proximity of the atmospheric stratum surrounding it to the surface of the earth.

The fact stated in the same paper that "in cold weather the air on the top of the hill is never so cold as that in the valley," is no doubt partly due to the cause above stated, but partly also, I think, to the fact that cold air is heavier than warm, and seeks the lowest position. I believe there is no doubt this is the explanation of the *glacières* or freezing caverns of the Jura described in the Rev. Harold Browne's book.

JOSEPH JOHN MURPHY

Old Forge, Dunmurry, Co. Antrim, May 8

Meteors

I OBSERVED a meteor at about half-past eleven on the night of the 8th inst., in the constellation Scorpio, which passed very close to the star Antares, travelling from right to left.

It appears to me worth remarking from the fact of its course lying very near, and roughly parallel to, that part of the ecliptic which corresponded to the earth's position in her orbit.

It traversed some eight or ten degrees of arc, and was visible for three or four seconds, gradually increasing in brightness till it was nearly on a par with Antares, which star it also resembled in colour. Its slow apparent motion immediately suggested the idea that it was moving in the same plane and direction as the earth; in fact, that it was overtaking us in an orbit just outside our own.

The course of another meteor, seen about half an hour earlier from a westerly window, and described to me as not very inferior to Jupiter, appears also to have lain in the direction of the

ecliptic, but from left to right, in the neighbourhood of the constellations Gemini, Cancer, or Leo.

It is rash to generalise from such insufficient data, but I conceive these meteors may both have belonged to a system whose orbit lies nearly in the plane of the earth's; the apparent retrograde motion of the last-named being caused by the direction of its path crossing our orbit at a point behind the earth's then place instead of in advance of it.

Cardiff, May 10

GEO. C. THOMPSON

The Ivory Crayfish

I THINK it may be interesting to some of the readers of NATURE to know that a specimen of the "Ivory crayfish," or *Astacus* (*Cambarus*) *pellucidus*, mentioned in the very interesting communication of Dr. Packard on the Mammoth Cave of Kentucky in NATURE, April 18, has been living in the aquarium-house in the Regent's Park for a considerable time. The specimen was brought over at the close of the last year by Mr. Boyd from the Mammoth Cave; it is now placed in the first fresh-water tank on the right hand of the visitor as he enters the aquarium. Its dark-loving habits do not permit it to be seen much, as it generally burrows partially under a large stone, from beneath which only the tips of its white claws can be seen.

Culverlea, Winchester, May 8

W. A. FORBES

THE AMERICAN ACADEMY OF SCIENCES

THE Annual Meeting of the National Academy of Sciences was convened, on the 16th of April last, at the Smithsonian Institution in Washington. The existence of this body was authorised by an Act of Congress passed in 1863; and it was originally limited to fifty members, designed to represent the most eminent men of science in the country, who were to be organised for the purpose of serving as advisers to the United States Government in questions of a scientific nature. The Academy has rendered excellent service in this capacity, and has had referred to it very many important questions, the satisfactory solutions of which have saved much money to the Government, and increased the efficiency of many of its bureaus. One condition of membership is that all such service to the Government is to be performed without charge.

As this Society, by its national character, takes the lead of State Institutions for a similar object, and the number of members was at first limited, considerable dissatisfaction was felt by many persons who believed themselves worthy of membership, but were excluded by this restriction. The Academy, therefore, after mature deliberation, decided to ask Congress to remove the limitation as to number, which being done, the principal business of the Academy at its late meeting consisted in the increase of its force. Twenty-five new members were selected, representing the various branches of theoretical and applied science, and the number is to be increased by five each succeeding year. Very few papers or communications were presented to the Academy, as all the time of the meeting was required in carrying out the changes involved by the alteration of the charter, including the formation of a new constitution and rules for its government.

The following is the list of members elected:—Prof. C. A. Young, Dartmouth; Prof. E. D. Cope, Philadelphia; Prof. J. Lawrence Smith, Louisville; W. S. Sullivan, Columbus; Prof. W. B. Rogers, Boston; J. H. Trumbull, Hartford; Prof. J. P. Cooke, Cambridge; Dr. A. S. Packard, jun., Salem; Prof. W. P. Trowbridge, New Haven; J. E. Oliver, Massachusetts; Prof. E. W. Hilgard, Oxford, Maine; Prof. R. Pumpelly, State Geologist, Missouri; Prof. J. H. Lane, Coast Survey; Prof. A. E. Verill, New Haven; Dr. J. W. Crafts; Theodore Lyman, Boston; Prof. A. M. Mayer, Stevens Institute, Hoboken; Prof. H. J. Clarke, Amherst; J. Ericsson; Prof. Hadley, New Haven; Dr. F. A. Genth, Philadelphia; Charles A. Schott, Coast Survey; Prof. A. H. Worthen, State Geologist, Illinois; Captain J. B. Eads, St. Louis; General H. L. Abbott, U.S.A.